

MARKET RISK AND STOCK PRICE VOLATILITY FOR FIRMS LISTED AT THE NAIROBI SECURITIES EXCHANGE

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ABSTRACT

The Nairobi Securities Exchange experienced recurrent instability in stock price volatility, between 2013 and 2025, with the NASI index rising to 191 points in 2018 before falling below 90 points in 2023, signaling weakened market performance and erosion of investor wealth. The research overall goal was to examine the effect of market risk on stock price volatility of firms listed at the NSE. Specifically, the research sought to determine the effect of exchange rates, interest rates, money supply, inflation, and foreign remittance inflows on stock price volatility. The research was anchored on the Efficient Market Hypothesis, Modern Portfolio Theory, Arbitrage Pricing Theory, and Noise Trader Theory. A quantitative causal explanatory time series research design was adopted using monthly secondary data for the period 2013 to 2025 obtained from the CBK, KNBS, NSE, and World Bank databases. The target population comprised all firms listed at the NSE, and a census approach was used to ensure complete market coverage. Diagnostic tests were conducted to confirm data adequacy and model reliability. Both descriptive and inferential analyses were used, where descriptive statistics summarized measures of central tendency and dispersion, while inferential analysis

involved correlation testing and regression estimation utilizing the Exponential Generalized Autoregressive Conditional Heteroskedasticity EGARCH (1,1) model executed in EViews 13 to capture asymmetric volatility dynamics. The findings showed that exchange rate and interest rates had a positive and significant effect on stock price volatility, money supply and foreign remittance inflows had a negative and significant effect, while inflation had a positive but insignificant effect during the study period. The research concluded that volatility at the Nairobi Securities Exchange was mainly driven by exchange rate and interest rate shocks, with liquidity and remittance inflows helping to moderate instability. It recommended maintaining exchange rate and interest rate stability, sustaining adequate liquidity, managing inflation prudently, and promoting remittance inflows to enhance market stability and investor confidence. Ethical standards were upheld, with all secondary data obtained from accredited institutional sources in line with research integrity requirements.

Key words: Exchange Rate, Foreign Remittance Inflows, Inflation, Interest Rates, Money Supply.

INTRODUCTION

Background of the Study

The stock price volatility has proved to be one of the most followed signals of financial stability in the global markets. It reflects the confidence of the investor and it has a direct influence on

long term investment flows and cost of raising capital by traded firms. According to the OECD (2022), volatility surges destroy trust in the market and cause companies to find it more difficult to raise money, whereas the World Bank (2023) observes that long-term uncertainty will lead to fewer investors in the developing economies. This not only turns the volatility management a technical problem but also a primary concern of regulators and policymakers who are mandated to ensure protection of growth and financial stability.

Market risk is significant as it defines the strength of financial systems, capital distribution and investor confidence. Policymakers will be in a position to keep the financial market stable by implementing preventive measures in the monetary and fiscal policy when the market risk is effectively comprehended and observed. Uncontrolled market risk, on the other hand, may cause contagion, sudden corrections in the price of assets, and tightening of credit (Moyo and Kasekende, 2023; Sun and Chang, 2020). The World Bank (2024) underlines that market risk is important issues to monitor in the emerging markets, like Kenya, where shocks caused by the exchange rate depreciation, inflation attacks, or liquidity crunch may rapidly disseminate through equity and banking markets. Alimi and Kaleem (2022) also observe that risk awareness about market risk aids in sustainable investment and enhances the effectiveness of diversification to investors.

Market risk can be measured in several ways depending on the variable of interest and the depth of data available. Common macro-based indicators include nominal and real interest rate changes, foreign exchange rate variability, inflation volatility, and fluctuations in money supply aggregates (Ali, Hassan, & Karim, 2020; Misman, Isa, & Ariff, 2020). In market wide models, conditional variance from GARCH type frameworks such as GARCH, EGARCH, and TGARCH is frequently used to quantify volatility persistence and asymmetry (Kumar & Tiwari, 2021; Chen, Fang, & Lin, 2023). Other advanced proxies include the Value at Risk metric, beta coefficients in Capital Asset Pricing models, and implied volatility indices derived from derivative markets (Omar, Wong, & Lee, 2022; Rahman & Anwar, 2023). For economies without deep derivatives markets, macroeconomic indicators remain the most reliable empirical measures of systematic market risk.

Statement of the Problem

This uncertainty can be seen in the experience of Kenya. The NSE reported a good performance till 2015, when the index on the Nairobi Exchange, the All Share Index (NASI), had risen above the 180 points, but this was succeeded by a long-term fall. As of 2023, the index was down almost 90 points and as of 2025 it was still not up to its previous levels (NSE, 2025). The market capitalization when compared to the same situation declined by a significant margin and wiped out trillion shillings of wealth held by investors. The analysts have credited this decline to a combination of depressed valuations, exit by foreign investors and over dependence on a handful of large-cap counters like Safaricom. The resultant effect has been continued underperformance as it prevents the exchange to direct the savings to the long-term investment. The results of the research in Kenya are inconsistent. Wagwa (2021) found that inflation was an important factor and interest rates were not, whereas Otajah (2020) found that exchange rates and interest rates were the most influential factors but used the high-level

models of the markets that did not consider firms-level information. These conflicting outcomes complicate efforts to determine what risks are of the utmost importance to the investors and regulators.

There are also methodological gaps. A significant proportion of the Kenyan literature has been based on descriptive statistics or linear regressions (Gitau, 2019; Ngugi and Jagongo, 2022), and they fail to represent volatility clustering or time persistence. Also those that utilized more sophisticated methods as in Ndumbi (2025) focused on the growth results of firms and not on volatility itself. Consequently, the so-called econometric models such as GARCH-family (that are created to estimate time-dependent volatility) are not used in the context of Kenya.

In addition to the methodology, contextual and geographical gaps exist. The majority of the comparative evidence either is Ghana, Nigeria, or Pakistan based (Adam and Tweneboah, 2018; Mohammad et al., 2019; Choudhry, 2022), and the findings simply cannot be grafted onto the market structure in Kenya. Within Kenya, some studies have considered specific variables, but few have examined them jointly within the long period of sustained NASI decline from 2013 to 2025. This leaves findings disconnected from the real experience of wealth erosion and market instability.

Research Objectives

The objective of the study was determine the effect of the market risk on Stock Price Volatility of Firms Listed at NSE, Kenya

Specific objectives

- i. To ascertain the influence of exchange rates on Stock Price Volatility of Firms Listed at NSE, Kenya
- ii. To establish the effect of interest rates on Stock Price Volatility of Firms Listed at NSE, Kenya
- iii. To assess the influence of money supply on Stock Price Volatility of Firms Listed at NSE, Kenya
- iv. To ascertain the effect of inflation on Stock Price Volatility of Firms Listed at NSE, Kenya
- v. To explore the effect of foreign remittance inflows Stock Price Volatility of Firms Listed at NSE, Kenya

Theoretical Review

Modern Portfolio Theory

This theory was postulated by Harry Markowitz during the 1950s, and it changed the concept of risk and reward balance of investors. Its main thesis was that investors could minimise the total risk of their portfolios not by not holding risky assets, but by diversifying them such that when one asset performs badly, another one will perform well (Markowitz, 1952). The diversification principle of the reduction of unsystematic risk has been widely tested. Elton, Gruber, and associates (2010) affirmed that the effect of diversification benefits are true in developed markets and Jorion and Khoury (1996) established that diversification asset

correlations vary across time, especially during financial crisis which diminishes the protective impact of diversification.

The theory relies on several assumptions, including rational and risk-averse investors who make decisions under a given investment horizon. In reality, though, actual markets tend to differ with these assumptions. As an illustration, the correlations between asset classes became more pronounced during the COVID-19 pandemic, and at that time portfolios which seemingly would be considered diversified started moving in the same direction. Gitagia (2020) similarly observed that fluctuations in macroeconomic and firm-specific conditions significantly influenced firm value among companies listed at the Nairobi Securities Exchange, suggesting that diversification benefits may weaken during periods of financial instability. Kihoro, Ngugi, and Mutua (2021) found in the African context that even diversified portfolios were vulnerable to shocks caused by interest rate and exchange movement, and this indicated the weakness of the model in emerging markets. These results indicate that diversification theoretically is effective, but it loses its predictive ability when the market stresses.

Modern Portfolio Theory was also applicable in this study since the theory linked the macroeconomic fluctuations to the portfolio in the Kenyan environment. The fluctuation in interest rates increased discount rates and decreased stock values and fluctuation in inflation and liquidity shifted the risk-return balance. The diversification feature of the theory was an effective way to explain the responses by investors at the NSE to systemic shocks and the effect of these portfolio changes on the overall stock price volatility.

Arbitrage Pricing Theory

Arbitrage Pricing Theory was postulated by Stephen Ross in 1976 as a loose adaptation of the one factor Capital Asset Pricing Model. According to the theory, a number of macroeconomic variables affect the asset prices and these variables relate to inflation, interest rates, exchange rates, and remittance inflows (Ross, 1976). In contrast to the CAPM that presumes only a single source of systematic risk, APT acknowledges that a variety of factors contribute to returns, some of which have varying effects on changes in prices. This multidimensional perspective is backed by empirical studies. In the United States, Chen, Roll, and Ross (1986) discovered that the primary cause of asset prices was inflation and interest rates, whereas in Nigeria, Mutuku and Kirwa (2015) also found out that domestic and external shocks had a joint effects on the equity market.

APT makes the presumption that markets are competitive and that arbitrage opportunities are possible but it is not based on perfect investor rationality. It is based on the law of one price which states that similar assets are supposed to yield similar returns. Nevertheless, determining the risk factors that are relevant may be challenging as they differ in each market (Obradović and Đurić, 2021). Moreover, frictionless markets are not real. In third-world markets, poor liquidity, high transactions, and regulatory failures tend to misalign price changes and challenge the assumptions of the theory (Dimitropoulos, Louca, and Papadopoulos, 2023).

In the research, a correlation between the variables of market risk and the volatility of stock prices was carried out on the basis of the Arbitrage Pricing Theory. It described the role of movements in exchange rate, interest rate, money supply, inflation and remittance inflows to be systematic sources of market risk and to affect overall price behavior. Fluctuating interest and exchange rates influence the expected returns, fluctuations in money supply and inflation will impact on the liquidity and purchasing power, and fluctuations in remittance inflows will affect market confidence. In this context, the research perceived stock price volatility at the NSE as the interaction of a combination of these macroeconomic variables within an open financial space.

Efficient Market Hypothesis

This hypothesis was advanced by Eugene Fama in 1970 to show how the prices of assets are a demonstration of all available information at a particular time. According to the theory, securities are fairly priced because markets are quick to inject new information on the interest rates, inflation and other basics of the economy in the prices (Fama, 1970). According to the hypothesis, the investors cannot always get the abnormal returns because the unexpected information is the reason that makes the price change. The recent study conducted by Phan and Zhou (2021) and Joshi, Li, and Sharma (2023) confirms that the existing capital market is quick to adjust to the changes in policies and macroeconomic announcements, which lead to the temporary volatility and equilibrium in the long term.

The theory assumes rationality of the investor action, an effective information flow, and the inability of the members of the market to systematically outperform the market. In practice, however, new markets are semi-efficient. Information asymmetry, low trading, and the lack of responsiveness to the change in the policy can exaggerate price changes (Agyapong and Twerefou, 2020; Odhiambo and Wanjiru, 2023). The implication of these inefficiencies is that the market will misprice economic news or respond to external shocks in a short run, which will shortly be corrected as new information is absorbed.

The Efficient Market Hypothesis emerges to explain the volatility of the stock price in this study because the exercise of stock volatility takes place as a continued adjustment of the markets to new macroeconomic information. The investor expectations are attributed to alteration of the exchange rate, inflation or interest rate implying information shocks. The theory thus gives a basis of explaining volatility as a requisite and logical element of price discovery in a market that reacts to the regular economic updates and policy moves.

Noise Trader Theory

Noise Trader Theory is the theory created by De Long, Shleifer, Summers, and Waldmann in 1990 that contradicts the notion that all investors are rational. It suggests that not all traders use fundamentals in making their decisions, some of them make decisions using sentiment, speculation or misinformation. These activities create random fluctuations in prices, otherwise referred to as noise that result in asset mispricing (De Long et al., 1990). Empirical research like the one by Lin, Huang and Zhang (2021) and Amadi and Ezeani (2022) conclude that

investor sentiment and herding effect contribute immensely to the volatility of the market, especially in emerging economies where information dissemination is not uniform.

Based on the theory, rational and irrational traders co-exist in financial markets. Mispricing may be taken advantage of by rational traders, but in the short run, noise traders may overpower and push prices off the equilibrium (Boubaker and Nguyen, 2020; Kocaarslan and Soytaş, 2023). This dynamic is what explains periods of excessive volatility that cannot be explained by fundamental factors alone. Biases in behavior, media effect, and speculation activity are also factors that are believed to lead to price movements that are self-reinforcing but not stabilizing.

This research relies on the Noise Trader Theory to explain why the stock price volatility at the NSE persists even after all the macroeconomic fundamentals have been factored in. Even in the cases when interest rates, inflation, or exchange rates are not changing, price changes can occur as a result of speculative trading and market rumors, emotional responses. The theory therefore complements the Arbitrage Pricing Theory by emphasizing behavioral factors that magnify volatility, offering a fuller understanding of both systematic and sentiment-driven risks in Kenya's equity market.

Empirical Review

Murungi and Kihoro (2020) studied volatility spillovers between the exchange rate and stock prices at the NSE with the help of a GARCH model. Their findings revealed that there was a great deal of volatility transfer among the currency and equity markets, something that proves the existence of exchange rate shocks in the market. However, their analysis was done on selected sectors only leaving a gap in scope and representativeness. The current research was broadened to include all of the listed companies to reflect the effects of volatility to the market across the exchange.

Njoroge and Mwangi (2022) examined the autoregressive distributed lag as the macroeconomic role of remittance inflows in Kenya. They discovered that remittances maintained stable exchange rates and improved liquidity which indirectly boosted market stability. Nevertheless, their model was not applied to stock market volatility and created a contextual gap. This was done in this current study by directing the remittance flows into the changes in the stock price at the Nairobi Securities Exchange.

Geyser and Lowies (2015) researched the impact of inflation on Southern African stock markets in a linear regression study. Their findings suggested that inflation had a disproportionate impact on the different industries with the more consumer-oriented sectors being more susceptible to price fluctuations. However, the rigidity of their models failed to capture the dynamics of short-term volatility, which created a gap in methodology. The current research has overcome this weakness using high frequency monthly data to form short run volatility patterns in Kenya stock market.

Abubakar and Kassim (2022) researched the connection between the fluctuations in interest rates and market performance through time-series regression analysis in Nigeria. They found that the rise in the interest rates decreased the activity and returns in the equity markets and therefore monetary tightening had a negative effect of cool down investor sentiment. Nevertheless, they used linear regression without volatility clustering and spillover effects, which showed a gap in methodology. The present research was able to overcome it using an EGARCH model to explain asymmetric and perpetual volatility reactions to interest rate shocks.

Ouma and Muriu (2021) examined the correlation between stock returns and money supply in Kenya in terms of time-series regression with monthly averages. Their findings suggested that there was a statistically substantial positive connection meaning that higher liquidity enhanced higher equity returns. However, they made their model linear, and it failed to consider time-varying volatility behavior, which is a methodology gap. The current research came to fill this gap by examining conditional variance instead of mean effects and offered a more holistic perspective of the effects of liquidity shifts in causing market instability.

RESEARCH METHODOLOGY

The study assumed a causal explanatory time-series research design. It was considered suitable since the study determined how changes in exchange rates, interest rates, inflation, the money supply, and foreign remittances affected the stock prices of firms traded on the NSE.

The current study uses Exponential Generalized Autoregressive Conditional Heteroskedastic model, which is referred to as EGARCH (1,1) model, initiated by Nelson (1991). The EGARCH model was selected due to its ability to model the asymmetry in the volatility responses to ensure that the adverse shocks (bad news) have a different effect compared to the optimistic shocks (good news) of the same magnitude.

The EGARCH (1,1) model used in this study is expressed as follows:

$$\begin{aligned} \text{Mean} & & & & & & & & & \text{equation:} \\ R_t & = & \omega & + & \Sigma(\alpha_i R_{t-i}) & + & \varepsilon_t \\ \text{Variance} & & & & & & & & & \text{equation:} \\ \log(\sigma_t^2) & = & \omega + \beta \log(\sigma_{t-1}^2) + \gamma(\varepsilon_{t-1}/\sigma_{t-1}) + \alpha|\varepsilon_{t-1}/\sigma_{t-1}| + \lambda_1 \log(\text{EXR}_{t-1}) + \lambda_2 \log(\text{IR}_{t-1}) + \lambda_3 \log(\text{MS}_{t-1}) \\ & + & \lambda_4 \log(\text{INF}_{t-1}) & + & \lambda_5 \log(\text{REM}_{t-1}) \end{aligned}$$

Where:

R_t – Stock market return at time t.

σ_t^2 – Conditional variance of stock returns, representing market volatility.

ω – Constant term representing baseline volatility.

α – Parameter capturing the symmetric (magnitude) effect of past shocks on volatility.

β – Parameter measuring volatility persistence over time.

γ – Leverage parameter capturing the asymmetric response of volatility to market shocks.

λ_1 – λ_5 – Coefficients measuring the effects of exchange rate (EXR), interest rate (IR), money supply (MS), inflation (INF), and remittance inflows (REM) on stock-price volatility.

All the macroeconomic variables were converted into logarithmic first differences to stabilize the variance and guarantee stationarity, as suggested by Gujarati and Porter (2020) and Wooldridge (2021). In this frame, $(\alpha + \beta)$ is the degree of volatility persistence and the 3rd sign, gamma, is the asymmetry. A negative γ implies that negative shocks contribute to volatility more than positive shocks, which is in line with the leverage effect that is witnessed in the financial market (Mensah and Njoroge, 2023).

The target population was all the listed, and actively traded firms on the NSE. These companies were the mainstay of the Kenya capital market, and an effective foundation through which to attempt to analyze the market-wide volatility dynamics.

Census method was used in this research due to the limited nature of the population of interest, which had of sixty-five firms traded in the NSE, which was known to be finite, well defined, and had extensive time series data.

The research only employed secondary sources that were acquired using a designed data extraction sheet designed to systematize the extraction of monthly values of the Nairobi All Share Index (NASI) and the selected market risk measures between March 2013 and February 2025. Variables measured in the extraction sheet were the month end NASI closing value, Central Bank Rate (CBR), Consumer Price Index (CPI) with the given base year, the rate of inflation, Kenya shilling to the U.S. dollar exchange rate, broad money supply (M3), and inflows of foreign remittances. To enable robustness checks and additional analysis, additional optional fields were added to market capitalization, trading turnover and firm level closing share prices.

Descriptive Analysis

In this section, the summary statistics of the main variables of the study i.e. Stock Price Volatility (NASI), Exchange Rate, Interest Rate (CBR), Money Supply, Inflation and Foreign Remittance Inflows are presented in Table 1 below.

Table 1 Descriptive Statistics

Variable	Mean	Median	Min	Max	Std. Dev.	Skew.	Kurt.	n
NASI (Index Points)	136.30	134.72	83.87	191.66	30.71	0.12	-1.21	145
Exchange Rate (KES/USD)	111.21	104.66	85.04	160.47	18.32	1.17	0.62	145
CBR (%)	9.56	9.52	7.02	12.99	1.55	0.24	-0.90	145
Money Supply (KES Bn)	2684.22	2570.20	1500.00	4353.50	825.16	0.37	-1.04	145
Inflation (%)	6.43	6.41	3.14	9.57	1.25	0.34	-0.33	145
Remittances (KES Bn)	41.99	39.07	19.85	79.30	16.74	0.50	-0.95	145

Research Data, 2026

The descriptive statistics in Table 1 summarize the behavior of key macroeconomic indicators influencing stock price volatility at the NSE. The NASI averaged 136.3 index points over the period, reflecting alternating phases of market recovery and contraction. The medium average standard deviation of 30.71 is a sign of a market whose fluctuations are more visible yet manageable, which means that although external events cause temporary shocks, the overall structural stability is not under threat.

The mean exchange rate of 111.21 KES per USD and a positive skewness prove the continuing devaluation of the Kenyan shilling, especially between 2020 and 2023.

Mean Central Bank Rate of 9.56 percent shows that Kenya has a relatively stable monetary policy position over the period of the study. Money supply was averaged to be about KES 2.68 trillion with wide variation of 1.5 trillion and 4.35. Nevertheless, the skewness is moderate and positive, and the standard deviation is large, which could imply that quick liquidity expansion might have increased market volatility on a periodic basis.

The average level of inflation was 6.43, with a tight discrepancy of 3.14 to 9.57. The allocation was almost even, which was in line with the CBK medium-term target range. The monthly average foreign remittance inflows were at KES 41.99 billion, which highlights their increasing macroeconomic importance. The positive skewness suggests that there are some spikes in remittances, which can be related to global recovery phases and diaspora investment projects. Similar observations on the influence of macroeconomic dynamics on financial sector performance were reported by Otondi and Gitagia (2025), who established that inflationary pressures significantly moderated operational outcomes within Kenyan commercial banks. In general, the descriptive analysis indicates that the NSE is exposed to a dynamic macroeconomic environment in which exchange rate fluctuations, inflationary pressures, and external capital inflows continue to shape stock market performance and investor behavior.

Stationarity Tests

The Augmented Dickey–Fuller (ADF), Phillips–Perron (PP), and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) tests were applied to determine the order of integration using monthly data from March 2013 to February 2025 (Asteriou & Hall, 2021).

Table 2: Unit-Root Tests for Macroeconomic Variables (ADF, PP, and KPSS)

Variable	ADF Statistic	PP Statistic	KPSS Statistic
Exchange Rate (KES/USD)	-1.912 (p = 0.329)	-2.041 (p = 0.269)	0.741 (p = 0.042)
Interest Rate (CBR %)	-2.273 (p = 0.186)	-2.018 (p = 0.281)	0.616 (p = 0.053)
Money Supply (M3, KES Bn)	-1.734 (p = 0.407)	-1.886 (p = 0.344)	0.712 (p = 0.041)
Inflation (CPI %)	-2.105 (p = 0.251)	-2.048 (p = 0.267)	0.653 (p = 0.048)
Remittance Inflows (KES Bn)	-2.245 (p = 0.196)	-2.389 (p = 0.155)	0.705 (p = 0.045)
NASI Returns (%)	-5.836 (p = 0.000)	-5.901 (p = 0.000)	0.103 (p = 0.121)

Research Data, 2026

Table 2 indicates that exchange rate, interest rate, money supply, inflation and remittance inflows were significantly non-stationary, failing to satisfy the 0.05 level of significance after the first-difference logarithmic transformation, but ADF and PP p-values both went below 0.01 after the first-difference logarithmic transformation and KPSS probabilities went above 0.05, indicating non-stationarity. The retained NASI levels were at a standstill ($p < 0.05$) that can be attributed to the likelihood of mean-reverting equity-return in emerging markets (Mwangi and Ngugi, 2023; Abidemi and Ibrahim, 2024).

Regression Analysis (EGARCH Estimation Results)

The Exponential Generalized Autoregressive Conditional Heteroskedasticity model, EGARCH (1,1), was estimated using EViews 13 to examine the influence of exchange rate, interest rate, money supply, inflation, and foreign remittance inflows on stock price volatility of firms listed at the Nairobi Securities Exchange. The EGARCH specification was adopted due to its ability to capture both the magnitude and asymmetry of volatility responses, allowing positive and negative shocks to exert differential effects on conditional variance.

The model was estimated under a Student-t error distribution to account for leptokurtic characteristics and heavy tails commonly observed in macro-financial time series data. In addition, the Quasi-Maximum Likelihood (QML) estimation technique was employed to obtain robust standard errors and ensure reliable statistical inference under potential deviations from normality. The estimated results of both the mean and variance equations are presented in Table 3.

Table 3: EGARCH (1,1) Estimation Results

Panel A: Mean Equation (Conditional Mean of Volatility)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.0173	0.0082	2.1090	0.0357
LOG(EXR _t)	0.2841	0.0724	3.9240	0.0001
CBR (%)	0.1128	0.0463	2.4380	0.0148
LOG(M3 _t)	0.1765	0.0675	2.6130	0.0089
CPI	0.0932	0.0448	2.0810	0.0386
LOG(REM _t)	0.1284	0.0587	2.1870	0.0287

Panel B: Variance Equation (EGARCH Volatility Dynamics)

Component	Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	C(7)	-0.1024	0.0380	-2.6960	0.0070
ARCH Effect (α)	ABS(Z _{t-1})	-0.0971	0.0380	-2.5530	0.0107
GARCH Effect (β)	LOG(σ^2_{t-1})	0.6902	0.0710	9.7180	0.0000
Leverage Effect (γ)	Z _{t-1}	0.2210	0.0490	4.5100	0.0000

Model Diagnostics

Statistic	Value
R-squared	0.6275

Adjusted R-squared	0.5987
Log likelihood	274.6230
Akaike AIC	-4.1630
Schwarz criterion	-3.8920
Durbin–Watson stat	2.0460

Research Data (2026)

Table 3 suggests that the estimated EGARCH (1,1) model provides a satisfactory fit to the data. The R-squared value of 0.6275 and adjusted R-squared of 0.5987 suggest that approximately 60 percent of the variation in conditional volatility is explained by the selected macro-financial variables. The log-likelihood value of 274.623 and relatively low information criteria (AIC = -4.163; SIC = -3.892) demonstrate strong model parsimony and predictive efficiency. Furthermore, the Durbin–Watson statistic of 2.046 indicates the absence of serial correlation in the residuals, confirming the reliability of the estimated model.

Volatility Dynamics (ARCH, GARCH and Leverage Effects)

Beyond the mean equation, the EGARCH (1,1) variance specification provides deeper insight into the behavior of stock price volatility through the ARCH effect, GARCH effect, and leverage effect. These components are critical in distinguishing the model from linear estimation approaches such as Ordinary Least Squares (OLS), as they explicitly capture time-varying volatility and asymmetric responses to shocks.

The ARCH effect (α), represented by the absolute standardized residual term $ABS(Z_{t-1})$, is estimated at -0.0971 ($p = 0.0107$) and is statistically significant. This signifies that recent disturbances exert a quantifiable short-term effect on current volatility, hence affirming the existence of volatility clustering in the NSE. The importance of this parameter indicates that phases of elevated volatility are likely to be succeeded by additional volatility, a prevalent trait of financial time series.

The GARCH effect (β), captured by the lagged conditional variance term $LOG(\sigma^2_{t-1})$, is 0.6902 ($p = 0.0000$) and highly significant. This demonstrates strong volatility persistence, indicating that approximately 69.02 percent of past volatility is transmitted into current volatility. The magnitude of this coefficient suggests that shocks to volatility decay slowly over time, reflecting structural characteristics of emerging markets such as delayed information diffusion and market inefficiencies.

The leverage effect (γ), represented by the standardized residual term Z_{t-1} , is 0.2210 ($p = 0.0000$) and statistically significant. This confirms the presence of asymmetric volatility, where the impact of shocks on volatility is not uniform. The positive coefficient implies that positive innovations exert a relatively stronger effect on volatility compared to negative shocks, highlighting the role of investor sentiment and speculative dynamics in shaping market fluctuations.

The joint significance of the ARCH, GARCH, and leverage parameters confirms that stock price volatility at the NSE is time-varying, persistent, and asymmetric. These findings validate

the appropriateness of the EGARCH (1,1) model, as it effectively captures volatility dynamics that cannot be explained using static models such as Ordinary Least Squares (OLS).

Following the analysis of volatility dynamics, the mean equation provides insight into the influence of macro-financial variables on stock price volatility; the estimated mean equation is expressed as

$$\text{LOG (GARCH)}_t = 0.0173 + 0.2841\text{LOG(EXR)}_t + 0.1128\text{CBR}_t + 0.1765\text{LOG(M3)}_t + 0.0932\text{CPI}_t + 0.1284\text{LOG(REM)}_t$$

The estimated coefficients indicate that all explanatory variables exert positive and statistically significant effects on stock price volatility. Specifically, exchange rate (0.2841), interest rate (0.1128), money supply (0.1765), inflation (0.0932), and foreign remittance inflows (0.1284) are positively associated with conditional volatility, implying that increases in these macro-financial variables contribute to heightened fluctuations in the equity market.

The constant term (0.0173) represents the baseline level of volatility when all macro-financial variables remain unchanged. The estimated coefficients reflect the marginal effects of each explanatory variable on conditional volatility within the EGARCH framework.

The estimates were obtained using EViews 13 under a Student-t distribution with QML-robust standard errors, confirming that the EGARCH (1,1) specification adequately captures asymmetry, volatility clustering, and non-normal characteristics inherent in financial time series (Brooks, 2022; Baltagi, 2021).

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The study concluded that the exchange rate variation has considerable positive implications on stock price volatility among the firms listed at NSE. Hence, the research concludes that Kenya shillings depreciation is the cause of heightened stock prices volatility, meaning that currency instability is a booster of market uncertainty and speculative changes. This result means that the capital market in Kenya is affected by changes in the foreign exchange market and capital market behavior amongst investors. This finding is consistent with the theory of Asset Pricing Volatility, which suggests risk spillover effects on the price of assets due to investor sentiment and liquidity reallocation because of changes in the exchange rates. It supports the idea that currency dynamics are priced in a systematic way in the NSE; it is one of the main volatility behavior drivers.

Another conclusion obtained in the study is that interest rates are important causative factors of stock price volatility and that the effect is positive. It was concluded that volatility increased with the increases in Central Bank rate, which indicate that tightening of the monetary policy increases the level of uncertainty in the equity market due to limitation of liquidity as well as increasing the cost of borrowing. This means that changes in the monetary policy directly affect the circulation of money within the finance system hence the perception of risk and balancing of portfolio by the investor. The conclusion confirms the Liquidity Preference Theory which

holds that during tightening liquidity periods, the investors require higher risk premium and therefore the asset markets become highly volatile.

On the money supply, the research comes up with a conclusion that the growth in the broad money (M3) greatly affects the volatility of the stock prices. This relationship means that an increase in liquidity promotes the activity of trade and the participation in the market but might also increase the speculative movements that can increase the short-term fluctuations. The conclusion implies that unchecked money creation may create asset bubbles and financial markets instability without being coupled with the real economic growth. This finding correlates with the Quantity Theory of Money which defines a direct relationship between the level of liquidity and change in prices of financial assets. It points out that the liquidity management plays a very significant role in making sure that the monetary growth is in support of productive investment and not speculative trading.

The discussion also concludes that inflation has a strong positive impact on stock price fluctuations. Increasing inflation was observed to augment market volatility through minimization of the actual worth of returns and the uncertainty surrounding the future profitability of investment. This conclusion implies that the inflationary pressures are misleading the expectations of the investors and exaggerating the capital market price changes. The finding is consistent with the Fisher Effect Theory that the inflationary expectations are reflected in the asset prices, and this affects the volatility of the asset prices by modifying nominal returns. It emphasizes the meaning of keeping the prices constant as an essential condition of predictable market behavior.

Lastly, the study arrives at the conclusion that inflows of foreign remittances have a strong impact on the volatility of the stock price. The findings suggested that remittance attacks raise market liquidity, and short-term speculation, and therefore, augment volatility in stock prices. Despite remittances stability of a country in terms of foreign exchange and an increase in capital inflows, this is caused by uneven distribution and cyclical nature that leads to short-term market disruptions. The result can be analyzed as the proof of the Capital Flow Volatility Hypothesis according to which inconsistent external inflows may destabilize the domestic financial market. It underlines that the long-term stability in the market and investor confidence requires sustainable management of the liquidity caused by remittance.

Policy Implications and Recommendations

The policy implications of the research findings are significant to the financial regulators, monetary authorities and market participants in Kenya. The analysis indicates that the volatility level is greatly increased by exchange rates movements and therefore, the research advises the CBK and the CMA to establish viable foreign-exchange hedging strategies like forward contracts, option, and currency futures in the market to ensure sustainable volatility levels. These tools would help the investors and companies to better control their exposure to the currency changes. Increasing transparency in foreign-currency reporting in corporates disclosures would also create more confidence in the eyes of investors and put the Kenya practice at par with those of the global market.

The result that increasing interest rates causes volatility implies that the Central Bank needs to embark on a forward-guidance strategy of communication in order to reduce all forms of uncertainty on the direction of the policies. Well-coordinated and prompt reporting of policy intentions can be used to stabilize investor expectations and minimize speculative responses in the capital market. Moreover, having a temporary liquidity assistance system in collaboration with the Capital Markets Authority might help to reduce the destabilizing impact of abrupt policy changes and keep credit conditions even in tightening periods.

Since the increase in the money supply was linked to greater volatility, the research suggests that the CBK should enhance macro-prudential regulation of liquidity increase. The institutionalization of monetary aggregate evaluation and their interconnection with the market activity should be periodically done to avoid excessive liquidity driving up the speculative trading. The synchronization of the fiscal and monetary policies to ensure that the liquidity growth is matched with the real sector investment would ensure stability and equilibrium in the market depth.

This positive correlation between inflation and the volatility of stock prices shows that there is a necessity to have effective measures in place to control inflation. By collaborating with the National Treasury, the CBK needs to improve inflation-targeting frameworks by factoring in supply-side factors that determine price stability. To help firms listed on NSE to report more realistic measures of performance and have better market value, they are urged to utilize inflation-adjusted financial reporting. These practices would help investors to make sound decisions even in the inflationary environments.

Lastly, the strong influence of inflows of remittance on volatility may imply that the Central Bank and the National Treasury ought to design stable investment tools of diaspora funds. Diaspora savings bonds and remittance-backed infrastructure securities are some of the initiatives that would aid in directing inflows to long-run productive activities and reduce speculative pressures. Enhancing the regulatory framework of digital remittance platforms would also increase transparency, predictability, and incorporation of those flows into the formal financial system.

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